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OPERATIONS AND MAINTENANCE MANUAL
WINCH OPERATORS PANEL

BAKER ATLAS 5715XA PANEL
F140529000
Kerr p/n AMS4A040

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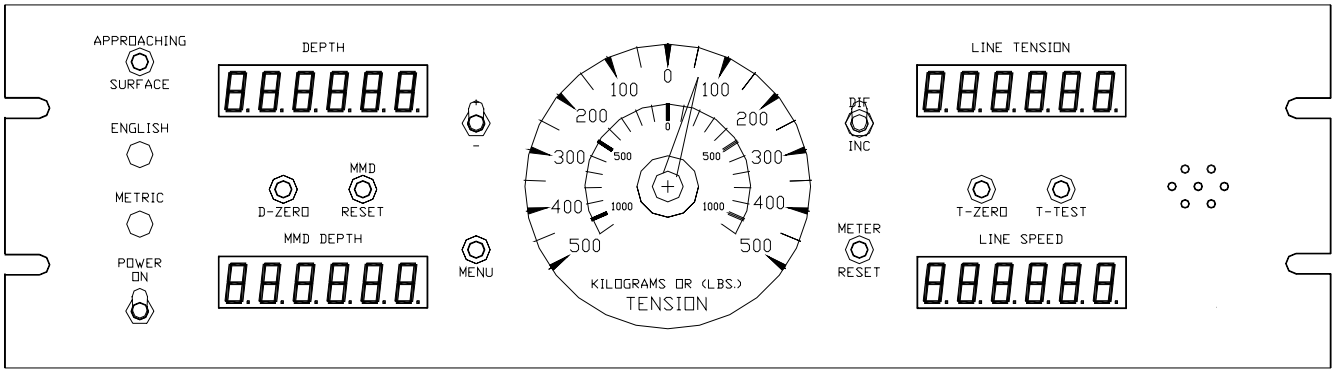
1.0 INTRODUCTION

1.1 GENERAL DESCRIPTION

This panel is designed to acquire and display depth, tension, and magnetic mark data from a wireline logging winch unit. The panel provides the operator a means to set and make adjustments to the data as necessary.

Depth is displayed from data provided from an encoder mounted on a measuring device. The encoder quadrature pulses are passed through to the acquisition system. The tension data is provided by a load pin and is also passed through to the acquisition system.

The panel can be set in either open hole logging or cased hole logging modes. It can also work with the Baker 3086 measuring head or the Kerr AM3K or AM5K measuring heads. This is done by setting jumpers on the main processor board (refer to section 2.1).



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1.2 FEATURES AND SPECIFICATIONS

-- Digital displays for depth, line speed, tension and magnetic marks (or CCL offset)

-- Analog incremental tension meter, 4 inch (108 mm) dia., 270 degree

-- Differential or Incremental tension zero push button switch

-- Excessive tension alarm setting allows operator to set tension alarm to a predetermined value. Contact closure is provided for winch shutdown

-- Zero Depth button - sets depth to 0. Depressing button again resets depth to previous setting. Only works when line speed is zero

-- Approaching surface alarm

-- Depth adjust up or down switches. Only works when winch is stopped

-- Load cell zero & calibrate controls. Only works when there is no load on cable

-- Depth & tension saved in non-volatile memory at power loss

-- Outputs for Magnetic Marks, Tension and Encoder to interface to an acquisition system.

-- RS485 Interface for additional control and data outputs.

-- Can be set to display either English or Metric units.

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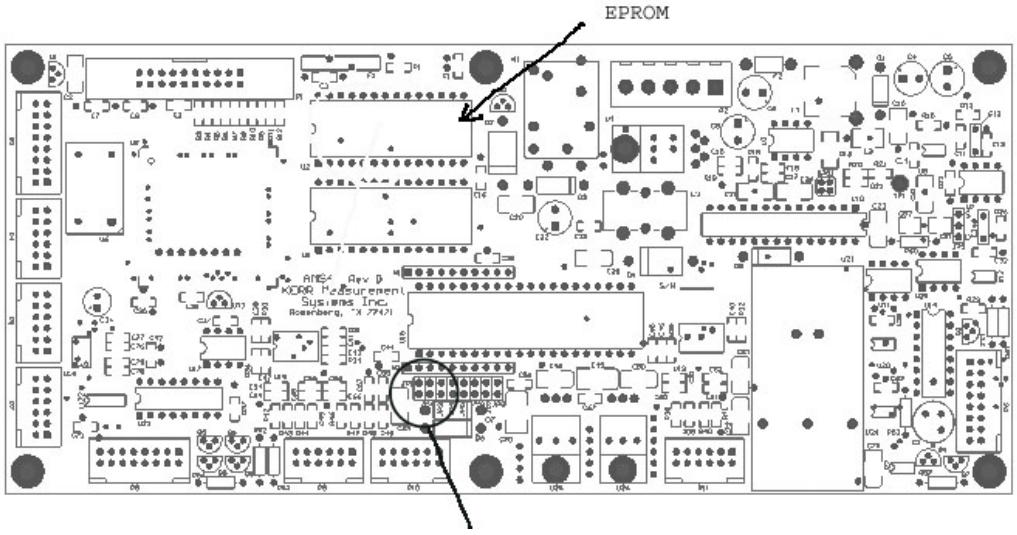
2.0 STARTUP AND SYSTEM OPERATING INSTRUCTIONS

2.1 JUMPER SETTINGS

A row of jumpers are located on the internal processor board. These jumpers are used to set the panel in different configurations.

The software that runs this system is stored in an EPROM located as shown below. To update the software replace this EPROM with one containing the latest version of software. The current version at the writing of this document is 4001.23.



J1 on = DEPTH IN METERS
J1 off = DEPTH IN FEET
J2 on = TENSION IN KG
J2 off = TENSION IN POUNDS
J3 on = AM3K + CASE OR HOIST
J4 off = Rev D or earlier PC board
J4 on = Rev E PC board
J5 on = AM5K + FOCUS mode
J3 + J5 off = AM5K + CASE

In the event of a jumper change, software change, panel "lock up" or other malfunction, the processor in the panel can be rebooted by turning off the panel, depressing the T-ZERO and T-TEST buttons simultaneously then turn the power back on while the buttons are depressed.

When the panel is rebooted, all the menu settings will be returned to the default settings. “RESET” should be displayed on the tension display during re-boot if 3K or 5K is selected.

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2.2 OPERATING INSTRUCTIONS

2.1 Power up panel and verify it is working properly.

2.2 Verify the panel is configured to match the system (head type, Acquisition System, encoder, etc.) Refer to section 2.1 for jumper settings

2.3 Set line size to match cable size installed in head (refer to menu settings).

2.4 Set Tension Alarm and the Tension Shutdown values.

2.5 Set up acquisition system:

2.6 Set depth adjust value.

2.7 Install cable in measuring head and lay it slack on the ground.

2.8 Zero the tension value by pressing T-Zero. Verify that panel tension reads 0. Verify tension is recorded on acquisition system.

2.9 Press T-Test and verify that panel tension reads 5000 (3k mode) or 10000 (5k or FOCUS mode). Verify tension is being properly recorded on acquisition system.

2.10 Pull tool to depth 0 position. Press D-Zero and verify that panel depth reads 0. Set acquisition system depth to 0 at this time.

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3.0 DETAILED DESCRIPTION OF FEATURES

3.1 FRONT PANEL

3.1.1 ANALOG TENSION METER

This meter displays either differential or incremental tension. This provides a more visual display of tension change.

3.1.2 INCREMENTAL/TOTAL TENSION SWITCH

This switch will change the analog meter from Incremental tension to Differential tension. Incremental tension provides a high resolution tension scale. It must be periodically reset as tension increases or decreases to keep it from pegging out. Differential tension provides a delta tension reading. The meter will slowly reset itself to 0 so the reset switch is not necessary.

3.1.3 METER RESET SWITCH

This switch will reset the meter to the 0 (center) position.

3.1.4 DEPTH DISPLAY

This meter provides a digital display of depth.

3.1.5 LINE TENSION DISPLAY

This meter provides a digital display of total line tension.

3.1.6 LINE SPEED DISPLAY

This meter provides a digital display of line speed.

3.1.7 MAGNETIC MARK DISPLAY

This meter provides a digital display of the depth where the last mark was detected. It is also used as a CCL offset display when the panel is configured for cased hole operations (MODE 3).

3.1.8 MAGNETIC MARK RESET

Pressing the MMD reset button clears the last mark setting. The next mark detected will be used to set the window for any subsequent marks.

3.1.9 ZERO DEPTH

Pressing this button will reset the depth to 0. Depressing the button again will reset the depth to the previous setting. The Zero Depth button will only work when the line speed is zero (i.e. winch not moving).

3.1.10 MENU

Pressing this button will activate the menu software. The software feature to be set will be displayed on the DEPTH display. The features can be toggled through by pressing the menu button until the desired feature is displayed.

3.1.11 + / - SWITCH

This switch is used for different functions. It is used to change the depth setting in either an up or down direction. The winch must be stopped before the depth can be set. In menu mode (see section 3.0) the switch is used to set menu parameters.

3.1.12 RESET SWITCH AND LED

This LED is lit and an audible alarm is sounded when the depth is less than 100' (30 m). This is a warning to the hoist operator that they are approaching surface and should take care to get the equipment safely out of the well. When the LED is depressed, the alarm will stop but the LED will continue to blink. Once the depth reading is greater than 100' (30 m), both the alarm and the LED will turn off.

The button is also used to reset the hoist shutdown relay in the event of a shutdown.

Note: On earlier models of this panel this switch is labeled APPROACHING SURFACE.

3.1.13 ENGLISH / METRIC UNITS

These LEDs will indicate if the panel is in English or metric mode. If the depth is set to English, the English LED will be lit. If the depth is set to Metric the Metric LED will be lit. The tension can be set to English (LBS) or Metric (KG) but it will not light the LED.

3.1.14 T-ZERO SWITCH

Use this switch to set the tension to 0 at the start of a logging run. This will zero out the tension circuit. The line should be slack through the head at this time.

3.1.15 T-TEST SWITCH

Press T-TEST and verify that the panel tension reads 10000 lbs (5K or FOCUS) or 5000 lbs (3K). Verify tension is being properly recorded on acquisition system.

3.2 REAR PANEL

3.2.1 12 – 24 VDC

This connector supplies dc power for the panel operation (9 VDC min, 30 VDC max). The panel can operate on either 12 or 24 vdc (12 vdc is U.S. truck standard voltage, 24vdc is European truck standard voltage). Pin A is positive, pin B is negative.

3.2.2 OVER TENSION CONTACT

This connector provides a connection to the overtension circuit relay. When an overtension condition is active, the two pins are connected together. In normal position the two pins are open. This feature can be used to interface to the winch unit control system to provide automatic hoist shutdown at an overtension condition.

3.2.3 SIGNAL INPUT

Encoder, tension, and magnetic mark signals and power are passed through this connector to/from the sensors on the measuring head.

3.2.4 SIGNAL OUTPUT

Encoder, tension, and magnetic mark signals, processed and some unprocessed are passed through this connector to the acquisition system.

3.2.5 RS485 SERIAL INTERFACE

This connector provides an RS485 interface from the panel to the acquisition system. Connectors are provided for both RS485 in and out.

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4.0 MENU COMMANDS – AM5K MODE

This panel has internal software which allows it to be set for various configurations. To change the settings, press the MENU button. The feature to be set will be displayed on the DEPTH display. Press the MENU button again until the feature you want to set is displayed.

The parameters for each feature will be displayed on the LINE TENSION display. Press the +/- switch to cycle through all the available parameters. When the value you want to select is displayed, press the MENU button. ACCEPT will then be displayed. Press + for yes, - for no.

In AM5K mode the panel is configured to work with the AM5K measuring head and the Baker Atlas CASE acquisition system.

Jumper J3 and J5 must both be removed to put the system in this mode (refer to section 2.1).

Following is a listing of all the available settings.

4.1 TENSION ALARM

When preset tension value is reached, alarm sounds and tension display flashes value

Procedure: Use +/- switch to set the tension alarm setting.

Indication: TENALM will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set.

Selection: Each cable size will have a corresponding Tension Alarm setting. Only the setting for the cable size selected (see menu option 2) can be adjusted.

Default Values

7-32	1500
9-32	2400
5-16	2400
3-8	2400
7-16	2400
15-32	2400
SLAM	2400
S-SLAM	2400

4.2 DELTA TENSION ALARM

When the delta tension setting is reached the alarm sounds. In incremental mode, you must periodically press meter reset or this alarm will sound when the tension reaches the set value. In differential mode, the meter will reset itself and the alarm will only sound on a quick change of tension.

Procedure: Use +/- switch to set the Delta Tension setting.

Indication: DTALRM will be displayed on the DEPTH display and the value being set will be displayed on the TENSION display as it is being adjusted.

4.3 TENSION SHUTDOWN

This value is added to the DTALRM or the TENALM settings to determine when the shutdown relay is activated.

Example:

If the TENALM is set to 4000 and the TENSDN is set to 500, the ALARM will sound when tension reaches 4000lbs and the OT contacts will close when tension reaches 4500lbs

If the Tension Alarm is set to 2000 and the Shutdown is set to 150 then the winch shutdown will occur at 2150 lbs.

Procedure: Use +/- switch to set tension shutdown setting

Indication: TSHTDN will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set.

Selection: Each cable size will have a corresponding Tension Alarm setting. Only the setting for the cable size selected can be adjusted.

Note: The RESET or Approaching Surface button needs to be depressed before the winch shutdown relay will de-energize.

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4.4 DEPTH ADJUST

The depth adjustment amount selected will automatically be added to or subtracted from the depth input.

Procedure: Use +/- switch to set the shim setting.

Indication: DP-ADJ will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set. The values are feet / thousand.
Default value is 0.

4.5 CABLE SIZE

Cable size selection automatically sets load pin angle setting for the selected cable size. Wheel size is also automatically set for the selected cable size.

Procedure: Use +/- switch to select cable size.
Indication: CABLE will be displayed on the DEPTH display and the selections will be displayed on the LINE TENSION display.

Cable Size Values available
- 7-32
- 9-32
- 5-16
- 3-8
- 7/16
- 15/32
- 15/32 HT (deep grooved High Tension wheel)
- SLAM (.472)
- SLAMHT
- S-SLAM (.484)
- U-SLAM (.490)
- OTHER

If OTHER is selected, two additional options are available. LCA and WHLCIR.

LCA (Load Cell Angle). This setting allows for the use of a sheave mounted load cell. The angle of the cable exiting the sheave should be entered. Typically for a load cell mounted above the top sheave the LCA would be 0. For a load cell mounted to the bottom sheave the LCA would be 90 (90 degrees). Default value is 0.

WHLCIR (Wheel Circumference). This value is set to the circumference of the measuring wheel to ensure the depth is measured correctly. Default value is 2.0 ft.

If the Baker 3086 DWMD is used, set this value to 2.5167.

4.6 DEPTH ALARM

When Alarm depth value is reached, the alarm will sound and LED will flash. Pressing the LED will turn off alarm but the light will continue to flash.

Procedure: Use +/- switch to set the depth alarm value.

Indication: DALARM will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set. Default value is 100’

4.7 CCL / MMD

When MMD is selected, the following menu options are available.

4.7.1 MMDCOR (MMD Correction)

Use +/- switch to toggle between ON or OFF

4.7.1.1 MMD CORRECTION ON

SPACNG

Use +/- switch to toggle between 100, 25 M, 50 M.

WINDOW

The MMD window determines when the next mark can be detected. The cable must travel at least the distance of the setting before a mark can be detected. Marks can only be detected if they occur within this window. If the window is set for 2', the mark must occur within +/- 2 feet of the mark spacing (i.e. if spacing is set to 100 then the mark must occur within 98 – 102 feet).

Procedure: Use +/- switch to change MMD window value.

Indication: MMD will be displayed on the DEPTH display and the window value will be displayed on the TENSION display as it is being set.

Pressing the MMD reset button clears the last mark setting.

MMD LOG

The depth of the first 25 detected marks is stored in memory and can be displayed.

Procedure: Use +/- switch to toggle through all of the marks that have been detected. This starts from the last mark detected. Pressing depth 0 will clear all the stored marks.

Indication: MMD DP will be displayed on the DEPTH display and the mark depth will be displayed on the TENSION display.

TOOLWT

The weight of the tool string at the end of the cable. Default value is 1000 lbs.

FLUIDW

The fluid weight of the well bore fluids. Default value is 8.3 lbs.

4.7.1.2 MMD CORRECTION OFF

SPACNG

Procedure: Use +/- switch to toggle between 100', 25M, 50M.

WINDOW

The MMD window determines when the next mark can be detected. The cable must travel at least the distance of the setting before a mark can be detected. Marks can only be detected if they occur within this window. If the window is set for 5', the cable must travel 5' from the last mark before a new mark can be detected.

MMD LOG

The depth of the first 25 detected marks is stored in memory and can be displayed.

Procedure: Use +/- switch to toggle through all of the marks that have been detected. This starts from the last mark detected. Pressing depth 0 will clear all the stored marks.

4.7.2 CCL OFFSET

The CCL depth will be displayed on the MMD/CCL display.
This makes it easier to monitor CCL depth in addition to bottom of tool depth.

Procedure: Use +/- switch to set the CCL offset depth

Indication: CCL will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set.

Use +/- switch to set the CCL offset.

4.7.3 CCL LOG

When CCL LOG is selected the panel will log collars.
When a casing collar signal is input, the current depth will be displayed on the CCL display.

NOTE: The CCL gain pot located on the PCB mounted to the inside rear of the panel may need to be adjusted to detect collars properly.

The following menu options are available:

4.7.3.1 LOG CCL

Displays latest 100 collars. Will overwrite the oldest collar after 100.
Press the +/- switch and you will be able to see the depth at which each casing collar was detected. The MMD/CCL display will display the depth of each collar when the switch is pressed.

4.7.3.2 CCL DLY

Use +/- switch to set delay from 1.0 to -0.1 Adds or subtracts to detected collar depth.

4.7.3.3 CCL_BP

Turns detected CCL audio on or off.

4.7.4 STRETCH CORRECTION

Use +/- switch to toggle between ON or OFF
When STRCOR is on, the panel will automatically correct depth to compensate for cable stretch. Stretch in the wireline is compensated in the following manner:

As the tool is lowered into the well the depth traveled is measured using the optical encoders 10 times a second. The tension is used to “back out” the stretch on the wireline for that segment and a non stretched depth is calculated by keeping a tally of all of the segments. This summed value is used in the following manner to calculate the depth:

If the tension is less than the calculated line weight the tool is assumed to be floating or supported in some other manner. The tension is due to the line weight so the stretch added is = summed depth * tension * Ks * 1/2 where Ks is the stretch coefficient. If the tension is greater than the line weight the stretch due to the line weight is calculated as above and all other weight is assumed to be acting over the entire length of the cable or = sum depth *((line weight * ½) + (tension-line weight)) * Ks

4.8 ENCODER

The value selected will automatically be used as the encoder input pulses per revolution (PPR) setting.

Procedure: Use +/- switch to set the ENCODER Pulse Per Revolution setting.

Indication: ENCODR will be displayed on the DEPTH display and the value will be displayed on the TENSION display.
Default value is 512.

Note: This setting does not change the encoder out setting. The encoder out setting is always set to 256 ppf.

4.9 ENCODER DIRECTION

The value selected will toggle the encoder direction between UP and Down.

Procedure: Use +/- switch to set the ENCODER direction setting.

Indication: ENCDIR will be displayed on the DEPTH display and either UP or DN value will be displayed on the TENSION display.

Default value is UP.

4.10 ENCODER SELECT

This function allows the user to change encoders by selecting a different encoder connected to the panel.

Procedure: Use +/- switch to select which encoder input on the rear panel will be used.

Indication: ENCSEL will be displayed on the DEPTH display and the encoder selected appears on the Depth display.

a. ENC 1
b. ENC 2

Note: Encoder 1 will always turn the opposite direction from encoder 2. In direct mode (see section 3.11), the encoder output will be in the same direction as encoder 1.

4.11 ENCODER OUT

This setting determines which encoder pulses that will be output to the acquisition system. Two options are available, Direct or Corrected pulses.

Direct will send out encoder pulses identical to the uncorrected pulses coming from encoder 1. None of the corrections applied by the panel will be sent to the acquisition system.

Correct will send out encoder pulses to the acquisition system that include all the corrections that the panel applies such as Depth Adjust (shim), MMD Correction, Wheel Size, etc.

Procedure: Use +/- switch to switch between Direct (DIRECT) or Corrected (CORRECT) pulses.

Indication: DIRECT or CORECT will be displayed on the DEPTH display.

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5.0 MENU COMMANDS – AM3K MODE

In this mode (cased hole) the panel is configured to work with the AM3K measuring head and the Baker Atlas CASE and HOIST acquisition systems.

Jumper J3 must be installed to put the system in this mode (refer to section 2.3).

5.1 TENSION ALARM

When preset tension value is reached, alarm sounds and tension display flashes value

Procedure: Use +/- switch to set the tension alarm setting.

Indication: TENALM will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set.

Selection: Each cable size will have a corresponding Tension Alarm setting. Only the setting for the cable size selected (see menu option 2) can be adjusted.

Default Values

7-32	1500
9-32	2400
5-16	2400
3-8	2400

5.2 DELTA TENSION ALARM

When the delta tension setting is reached the alarm sounds. In incremental mode, you must periodically press meter reset or this alarm will sound when the tension reaches the set value. In differential mode, the meter will reset itself and the alarm will only sound on a quick change of tension.

Procedure: Use +/- switch to set the Delta Tension setting.

Indication: DTALRM will be displayed on the DEPTH display and the value being set will be displayed on the TENSION display as it is being adjusted.

5.3 TENSION SHUTDOWN

This value is added to the DTALRM or the TENALM settings to determine when the shutdown relay is activated.

Example:

If the TENALM is set to 4000 and the TENSDN is set to 500, the ALARM will sound when tension reaches 4000lbs and the OT contacts will close when tension reaches 4500lbs

If the Tension Alarm is set to 2000 and the Shutdown is set to 150 then the winch shutdown will occur at 2150 lbs.

Procedure: Use +/- switch to set tension shutdown setting

Indication: TSHTDN will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set.

Selection: Each cable size will have a corresponding Tension Alarm setting. Only the setting for the cable size selected can be adjusted.

Note: The RESET or Approaching Surface button needs to be depressed before the winch shutdown relay will de-energize.

5.4 DEPTH ADJUST

The depth adjustment amount selected will automatically be added to or subtracted from the depth input.

Procedure: Use +/- switch to set the shim setting.

Indication: DP-ADJ will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set. The values are feet / thousand.
Default value is 0.

5.5 LOGGING SYSTEM TYPE

This setting determines the encoder pulse rate that will be output to the acquisition system. The tension scale will also be determined by this setting.

Procedure: Use +/- switch to select Logging System type.

Indication: LOGSYS will be displayed on the DEPTH display. and either CASE or HOIST will be displayed on the TENSION display.

CASE:

Encoder output:	256 pulses per foot
Tension:	1.5vdc = 20,000 lbs

HOIST:

Encoder output:	600 pulses per foot
Tension:	5vdc = 10,000 lbs

Note: Use the 4-20ma output signal for tension to the HOIST system. Install a 250 ohm resistor across the 4-20ma output to get the 0 – 5vdc voltage drop required.

5.6 CABLE SIZE

Cable size selection automatically sets load pin angle setting for the selected cable size. Wheel size is also automatically set for the selected cable size.

Procedure: Use +/- switch to select cable size.
Indication: CABLE will be displayed on the DEPTH display and the selections will be displayed on the LINE TENSION display.

Cable Size Values available
- 7-32
- 9-32
- 5-16 (Default setting)
- 3-8

5.7 DEPTH ALARM

When Alarm depth value is reached, the alarm will sound and LED will flash. Pressing the LED will turn off alarm but the light will continue to flash.

Procedure: Use +/- switch to set the depth alarm value.

Indication: DALARM will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set. Default value is 100’

5.8 CCL

When selected, two other options will be available -
CCL OFFSET and CCL LOG

5.8.1 CCL OFFSET

The CCL depth will be displayed on the MMD/CCL display.
This makes it easier to monitor CCL depth in addition to bottom of tool depth.

Procedure: Use +/- switch to set the CCL offset depth

Indication: CCL will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set.

Use +/- switch to set the CCL offset.

5.8.2 CCL LOG

When CCL LOG is selected the panel will log collars.
When a casing collar signal is input, the current depth will be displayed on the CCL display.

NOTE: The CCL gain pot located on the PCB mounted to the inside rear of the panel may need to be adjusted to detect collars properly.

The following menu options are available:

LOG CCL

Displays latest 100 collars. Will overwrite the oldest collar after 100.
Press the +/- switch and you will be able to see the depth at which each casing collar was detected. The MMD/CCL display will display the depth of each collar when the switch is pressed.

CCL DLY

Use +/- switch to set delay from 1.0 to -0.1 Adds or subtracts to detected collar depth.

CCL_BP

Turns detected CCL audio on or off.

5.9 STRETCH CORRECTION

Use +/- switch to toggle between ON or OFF
When STRCOR is on, the panel will automatically correct depth to compensate for cable stretch. The following information will then be requested:

Stretch in the wireline is compensated in the following manner:

As the tool is lowered into the well the depth traveled is measured using the optical encoders 10 times a second. The tension is used to “back out” the stretch on the wireline for that segment and a non stretched depth is calculated by keeping a tally of all of the segments. This summed value is used in the following manner to calculate the depth:

If the tension is less than the calculated line weight the tool is assumed to be floating or supported in some other manner. The tension is due to the line weight so the stretch added is = summed depth * tension * Ks * 1/2 where Ks is the stretch coefficient. If the tension is greater than the line weight the stretch due to the line weight is calculated as above and all other weight is assumed to be acting over the entire length of the cable or = sum depth *((line weight * ½) + (tension-line weight)) * Ks

5.10 ENCODER

The value selected will automatically be used as the encoder input pulses per revolution (PPR) setting.

Procedure: Use +/- switch to set the ENCODER Pulse Per Revolution setting.

Indication: ENCODR will be displayed on the DEPTH display and the value will be displayed on the TENSION display.

Default value is 1200.

5.11 ENCODER DIRECTION

The value selected will toggle the encoder direction between UP and Down.

Procedure: Use +/- switch to set the ENCODER direction setting.

Indication: ENCDIR will be displayed on the DEPTH display and either UP or DN value will be displayed on the TENSION display.

Default value is UP.

5.12 ENCODER OUT

This setting determines which encoder pulses that will be output to the acquisition system. Two options are available, Direct or Corrected pulses.

Direct will send out encoder pulses identical to the uncorrected pulses coming from encoder 1. None of the corrections applied by the panel will be sent to the acquisition system.

Correct will send out encoder pulses to the acquisition system that include all the corrections that the panel applies such as Depth Adjust (shim), MMD Correction, Wheel Size, etc.

Procedure: Use +/- switch to switch between Direct (DIRECT) or Corrected (CORRECT) pulses.

Note: The encoder output is fixed regardless of this setting or the encoder PPR setting.

CASE = 256 pulses per foot
HOIST = 600 pulses per foot

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6.0 MENU COMMANDS – FOCUS MODE

In this mode (open hole) the panel is configured to work with the AM5K measuring head and the Baker Atlas FOCUS acquisition system.

In this mode, the panel becomes a slave to the FOCUS system. Any changes to settings made in the panel will only change the panel displays and will not be output to the computer system. The FOCUS system updates the panel by means of the RS485 serial ports on the rear of the panel.

Jumper J3 must be removed and J5 installed to put the system in this mode (refer to section 2.1).

6.1 CABLE SIZE

Cable size selection automatically sets load pin angle setting for the selected cable size.

If other is selected, the LCA value needs to be entered. This value is based on the bend angle of the cable over the tension wheel. This value is empirically derived and must be furnished by the measuring head manufacturer.

Procedure: Use +/- switch to select cable size.

Indication: CABLE will be displayed on the DEPTH display and the selections will be displayed on the LINE TENSION display.

Cable Size Values available
- 7-32
- 9-32
- 5-16
- 3-8
- 7-16
- 15-32
- SLAM
- S-SLAM

Default value is 7-16

6.2 TEN ALARM

When preset tension value is reached, alarm sounds and tension display flashes value

Procedure: Use +/- switch to set the tension alarm setting.

Indication: TALARM will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set.

Selection: Each cable size will have a corresponding Tension Alarm setting. Only the setting for the cable size selected (see menu option 1) can be adjusted.

Default Values

7-32	1500
9-32	2400
5-16	2400
3-8	2400
7-16	2400
15-32	2400
SLAM	2400
S-SLAM	2400

6.3 TENSION SHUTDOWN

When value is reached, alarm sounds, tension display flashes value, and tension contact closure switch is closed. This can be used to provide a signal to automatically stop the winch.

Procedure: Use +/- switch to set tension shutdown setting

Indication: TSHTDN will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set.

Selection: Each cable size will have a corresponding Tension Alarm setting. Only the setting for the cable size selected can be adjusted.

Default Values

7-32	2000
9-32	3000

5-16	3500
3-8	3500
7-16	3500
15-32	3500
SLAM	3500
S-SLAM	3500

Note: The RESET or Approaching Surface button needs to be depressed before the winch shutdown relay will de-energize.

6.4 DELTA TENSION ALARM

When the delta tension setting is reached the alarm sounds. In incremental mode, you must periodically press meter reset or this alarm will sound when the tension reaches the set value. In differential mode, the meter will reset itself and the alarm will only sound on a quick change of tension.

Procedure: Use +/- switch to set the Delta Tension setting.

Indication: DTALRM will be displayed on the DEPTH display and the value being set will be displayed on the TENSION display as it is being adjusted.

6.5 DELTA TENSION SHUTDOWN

When value is reached, alarm sounds, tension display flashes value, and tension contact closure switch is closed. This can be used to provide a signal to automatically stop the winch.

Procedure: Use +/- switch to set tension shutdown setting

Indication: DTSTDN will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set.

Note: This parameter is derived from the reading on the analog meter. If the DTSHDN value is set to 500 then whenever the tension reading on the meter is greater than 500 the winch shutdown relay will be activated.

Note: The RESET or Approaching Surface button needs to be depressed before the winch shutdown relay will de-energize.

6.6 DEPTH ADJUST

The amount selected will automatically be added or subtracted from the depth input.

Procedure: Use +/- switch to set the shim setting.

Indication: DP-ADJ will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set. The values are feet / hundred.

Default value is 0.

6.7 DEPTH ALARM

When Alarm depth value is reached, the alarm will sound and LED will flash. Pressing the LED will turn off alarm but the light will continue to flash.

Procedure: Use +/- switch to set the depth alarm value.

Indication: DALARM will be displayed on the DEPTH display and the value will be displayed on the TENSION display as it is being set.
Default value is 100’

6.8 MMD

The MMD window determines when the next mark can be detected. The cable must travel at least the distance of the value set before a mark can be detected. Marks can only be detected if they occur within this window. I.E. If the window is set for 95', the cable must travel 95' from the last mark before a new mark can be detected.

Procedure: Use +/- switch to change MMD window value.

Indication: MMD will be displayed on the DEPTH display and the window value will be displayed on the TENSION display as it is being set.

Pressing the MMD reset button clears the last mark setting.
Default value is 5’

6.9 ENCODER

The value selected will automatically be used as the encoder input pulses per revolution (PPR) setting.

Procedure: Use +/- switch to set the ENCODER Pulse Per Revolution setting.

Indication: ENCODR will be displayed on the DEPTH display and the value will be displayed on the TENSION display.

Selection: 1200 (600 ppf or 1968 ppm)
780 (390 ppf or 1280 ppm) – Default Value
512 (256 ppf or 1680 ppm)

6.10 ENCODER DIRECTION

The value selected will toggle the encoder direction between UP and Down.

Procedure: Use +/- switch to set the ENCODER direction setting.

Indication: ENCDIR will be displayed on the DEPTH display and either UP or DN value will be displayed on the TENSION display. Default value is UP.

6.11 ENG – MET UNITS

The depth and tension values will be displayed in the units selected.

Procedure: Use +/- switch to set the MEASUREMENT UNITS setting.

Indication: UNITS will be displayed on the DEPTH display. The selection can be toggled through any combination of English or Metric units. The selection will be displayed on the TENSION display. The ENGLISH (green) LED display will be lit when FT – LBS is selected and the METRIC (red) LED will be lit when in any of the other modes.

Selection:

FT - LBS
FT - KG
MT - LBS
MT - KG
Default value is FT – KG

6.12 HEAD TYPE

Two options are available: 5 (AM5K) and OTHER

If OTHER is selected, two additional options are available. LCA and WHLCIR.
LCA (Load Cell Angle). This setting allows for the use of a sheave mounted load cell. The angle of the cable exiting the sheave should be entered. Typically for a load cell mounted above the top sheave the LCA would be 0. For a load cell mounted to the bottom sheave the LCA would be 90 (90 degrees). Default value is 0.

WHLCIR (Wheel Circumference). This value is set to the circumference of the measuring wheel to ensure the depth is measured correctly. Default value is 2.0 ft. To use a Baker 3086 measuring head set the wheel size to 2.517 ft.

6.13 DELTA TENSION SCALE

This option allows the Delta Tension scale to be set to either 500 or 1000 lbs or kgs. The meter has two scales, the outer scale is 500 and the inner scale is 1000.

Procedure: Use +/- switch to set the Delta Tension Scale setting.

Indication: DTSCLE will be displayed on the DEPTH display and either 500 or 1000 will be displayed on the TENSION display.

Default value is 1000.

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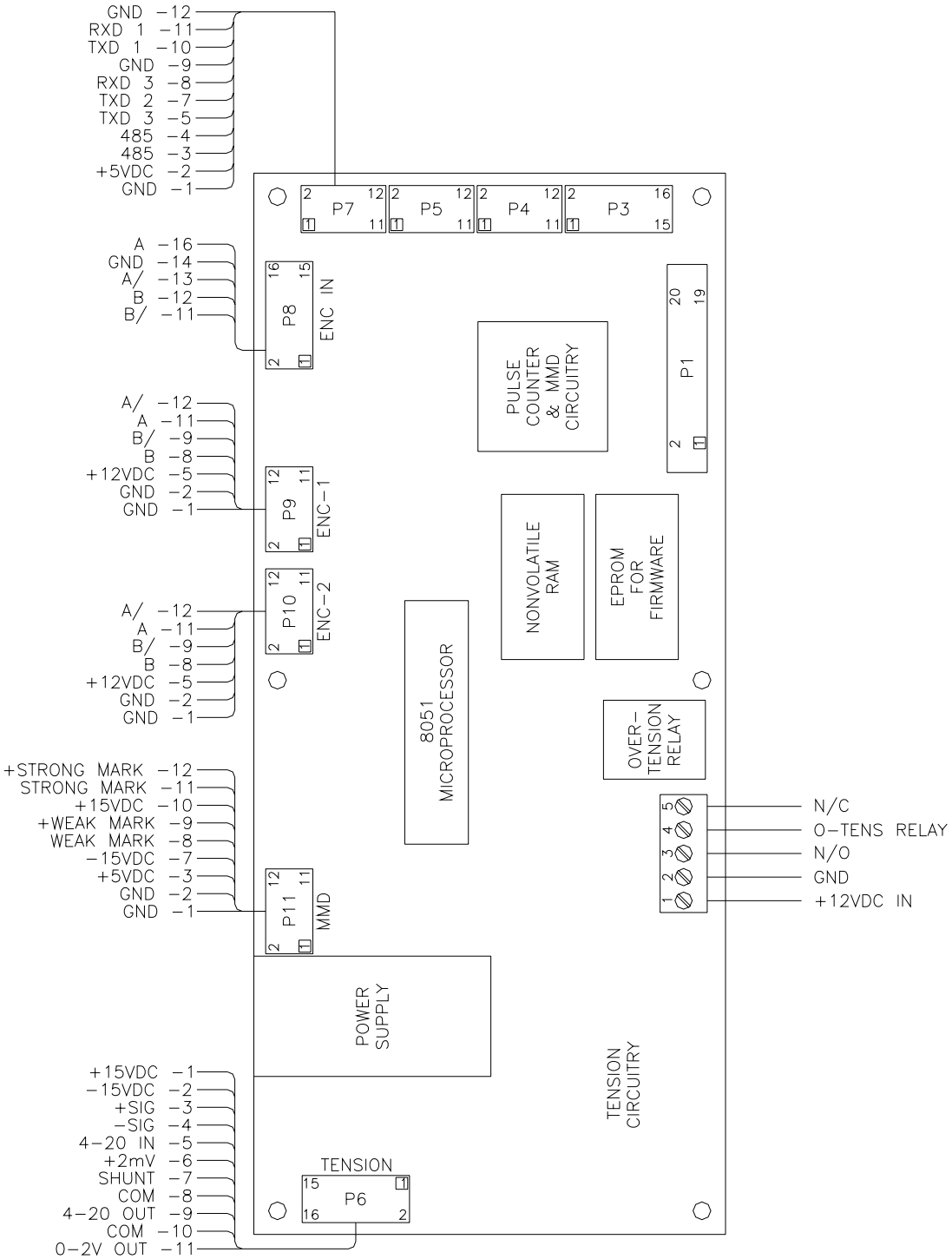
7.0 DRAWINGS AND PARTS LISTS

7.1 Main Processor Board



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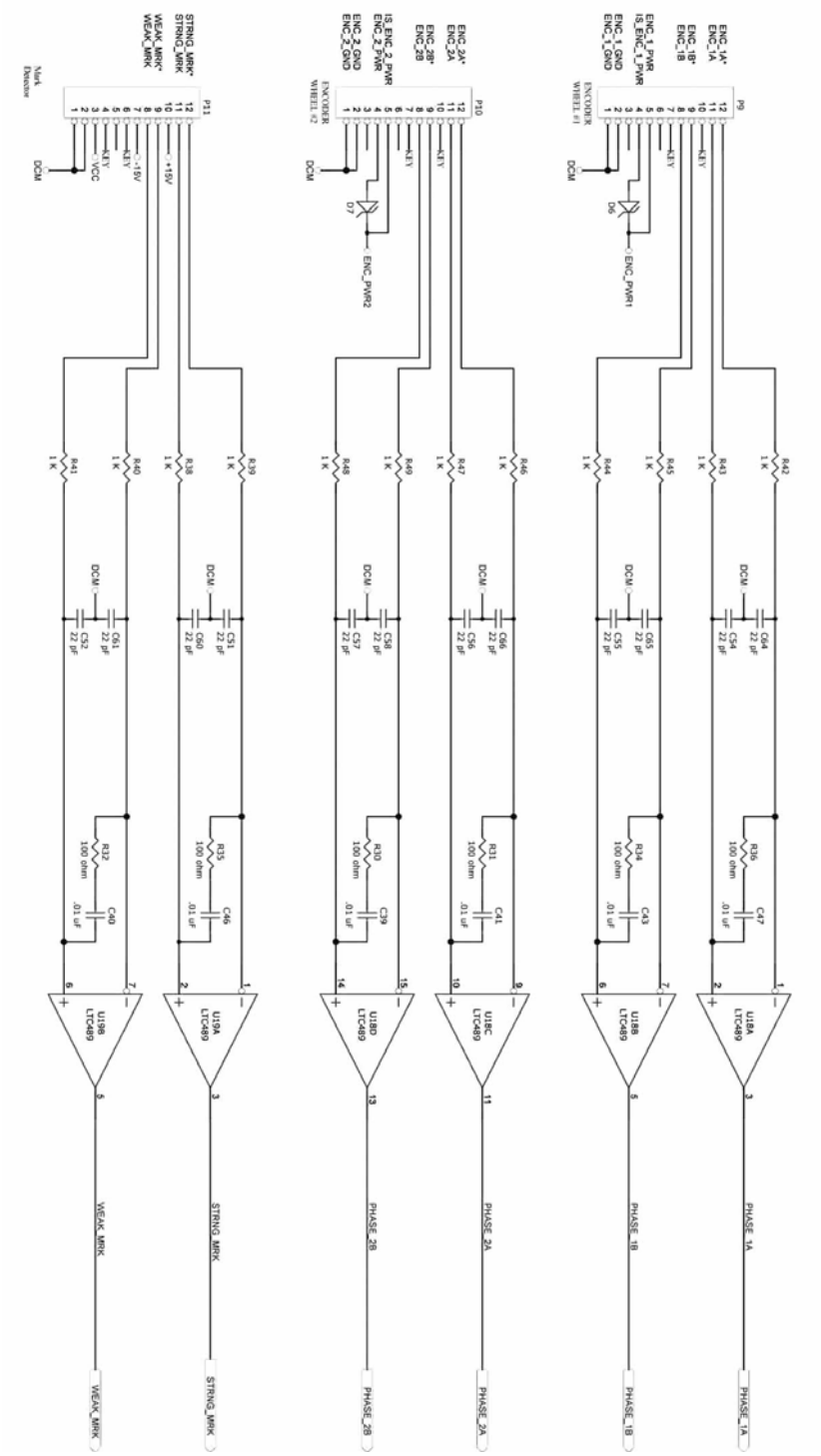
7.1.1 ENCODER AND MMD INPUTS



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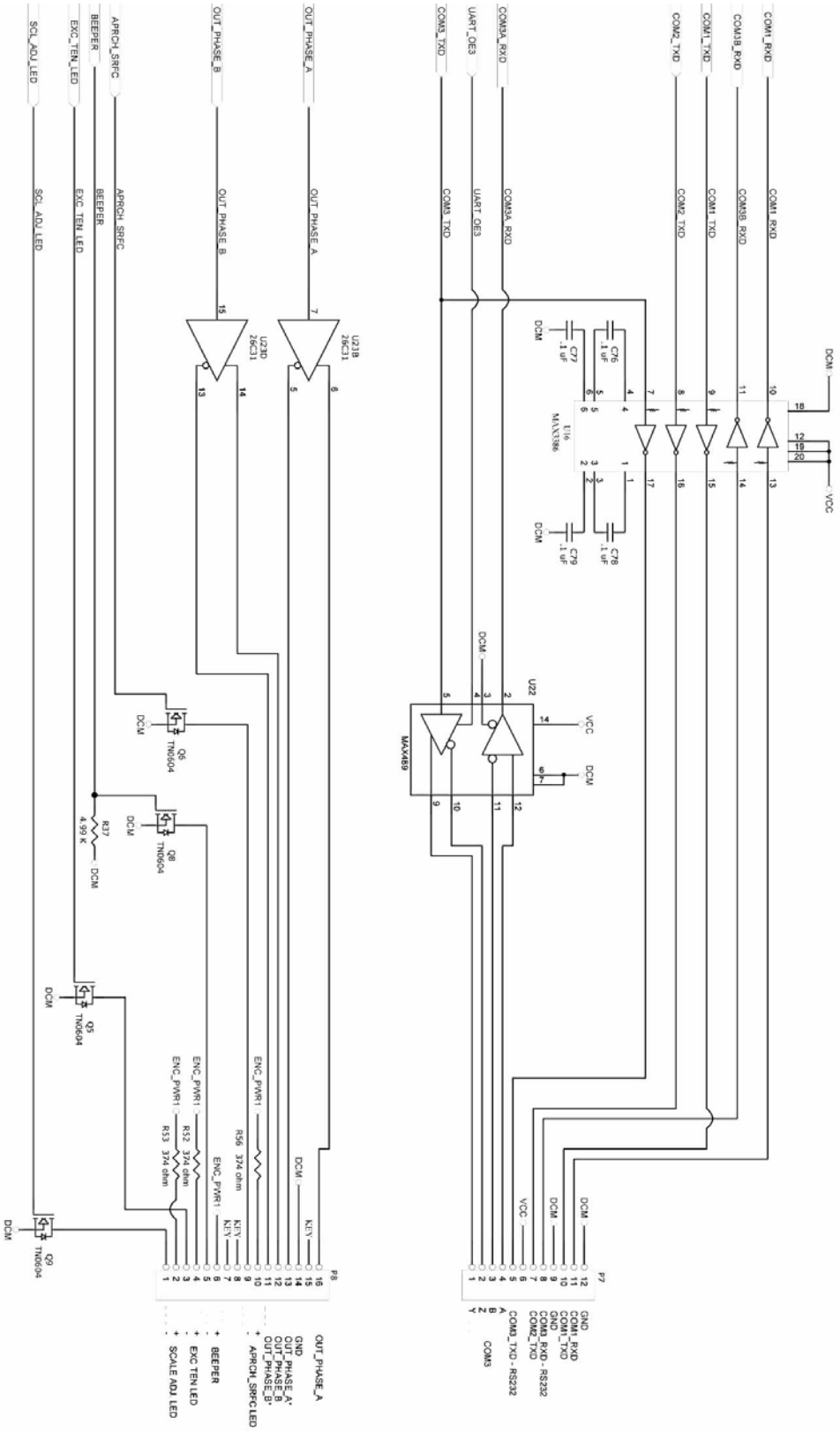
7.1.2 ENCODER OUTPUT AND COM PORT I/O



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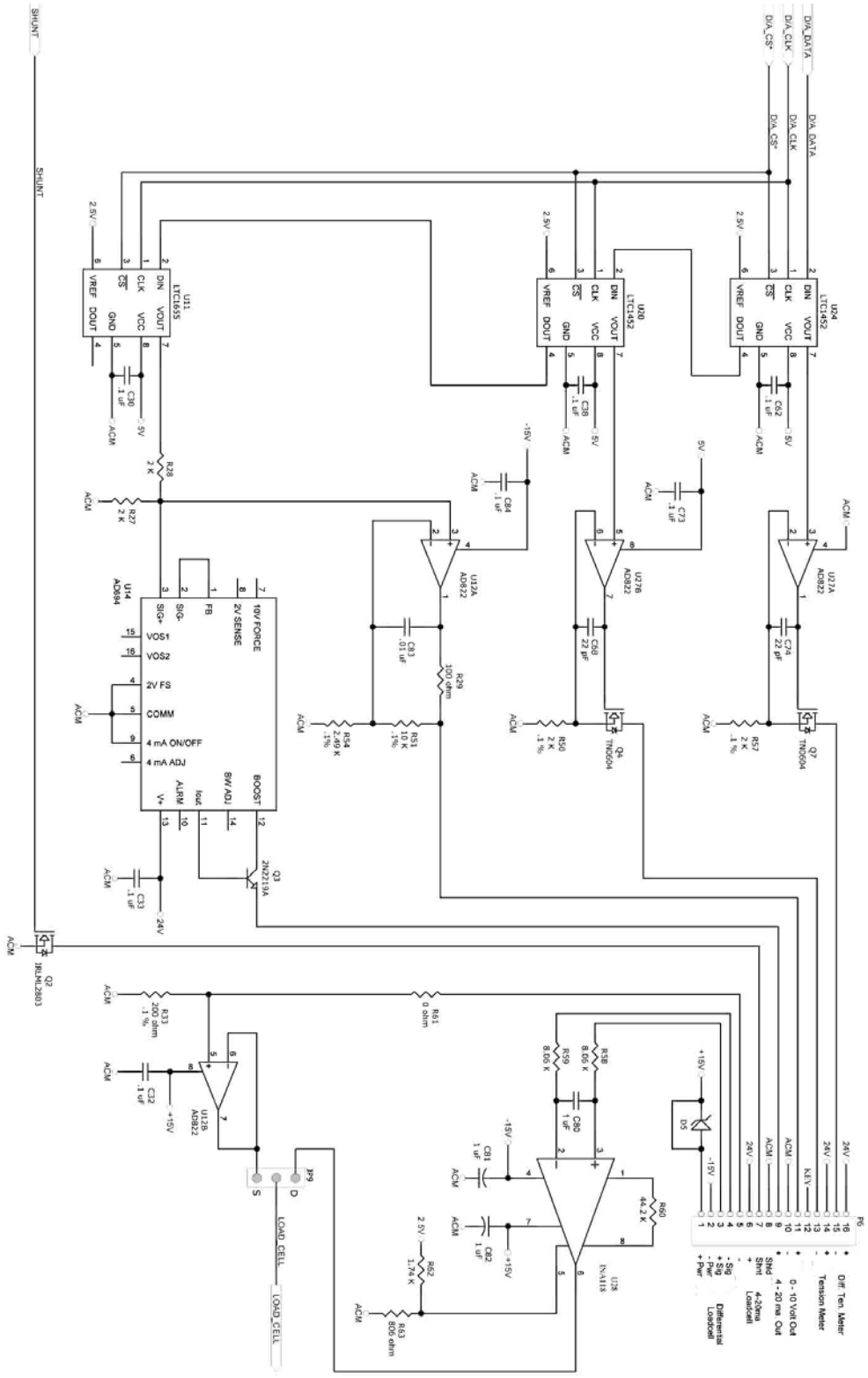
7.1.3 LOAD PIN AND TENSION I/O



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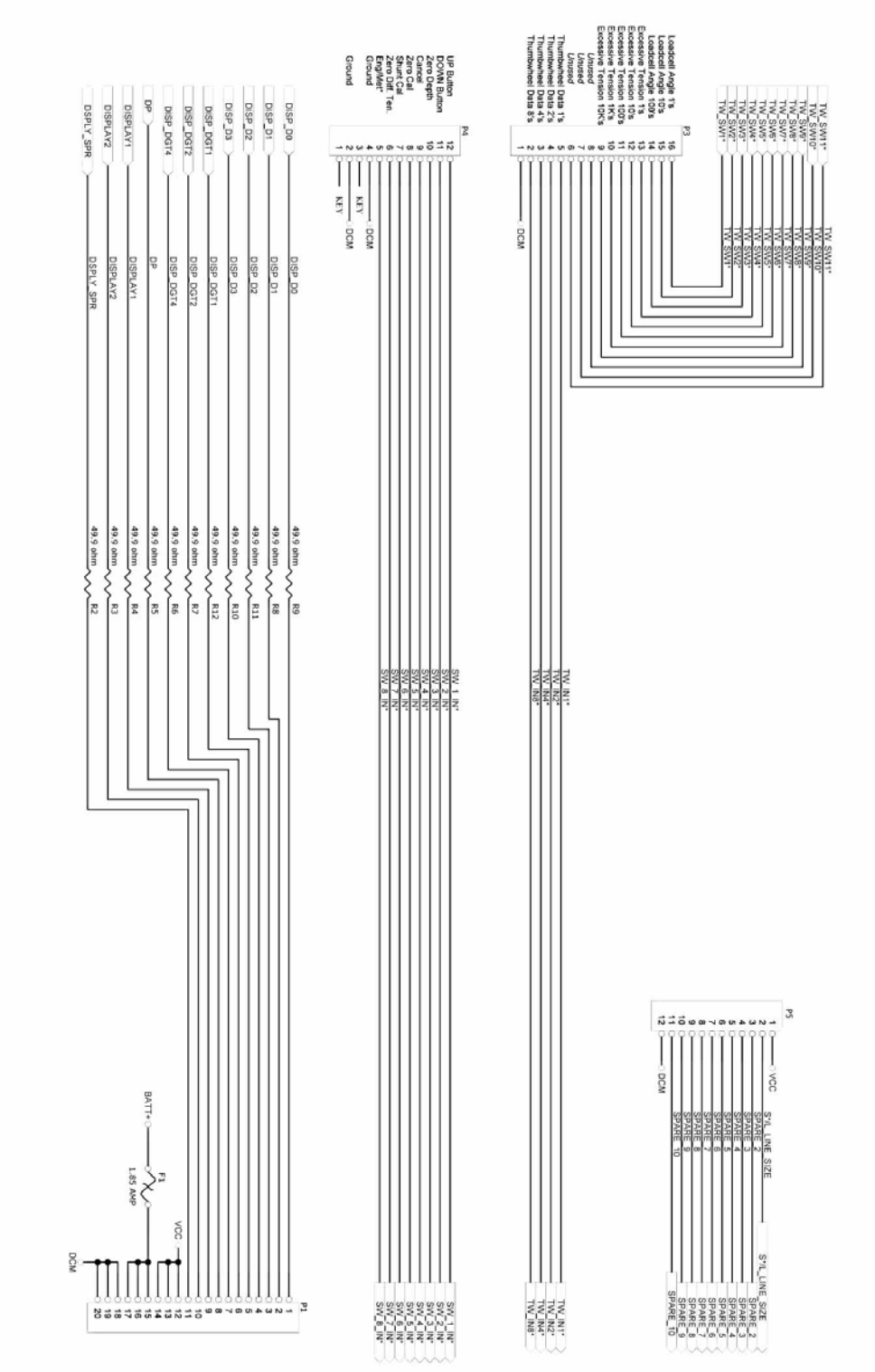
7.1.4 JUMPERS – BUTTONS



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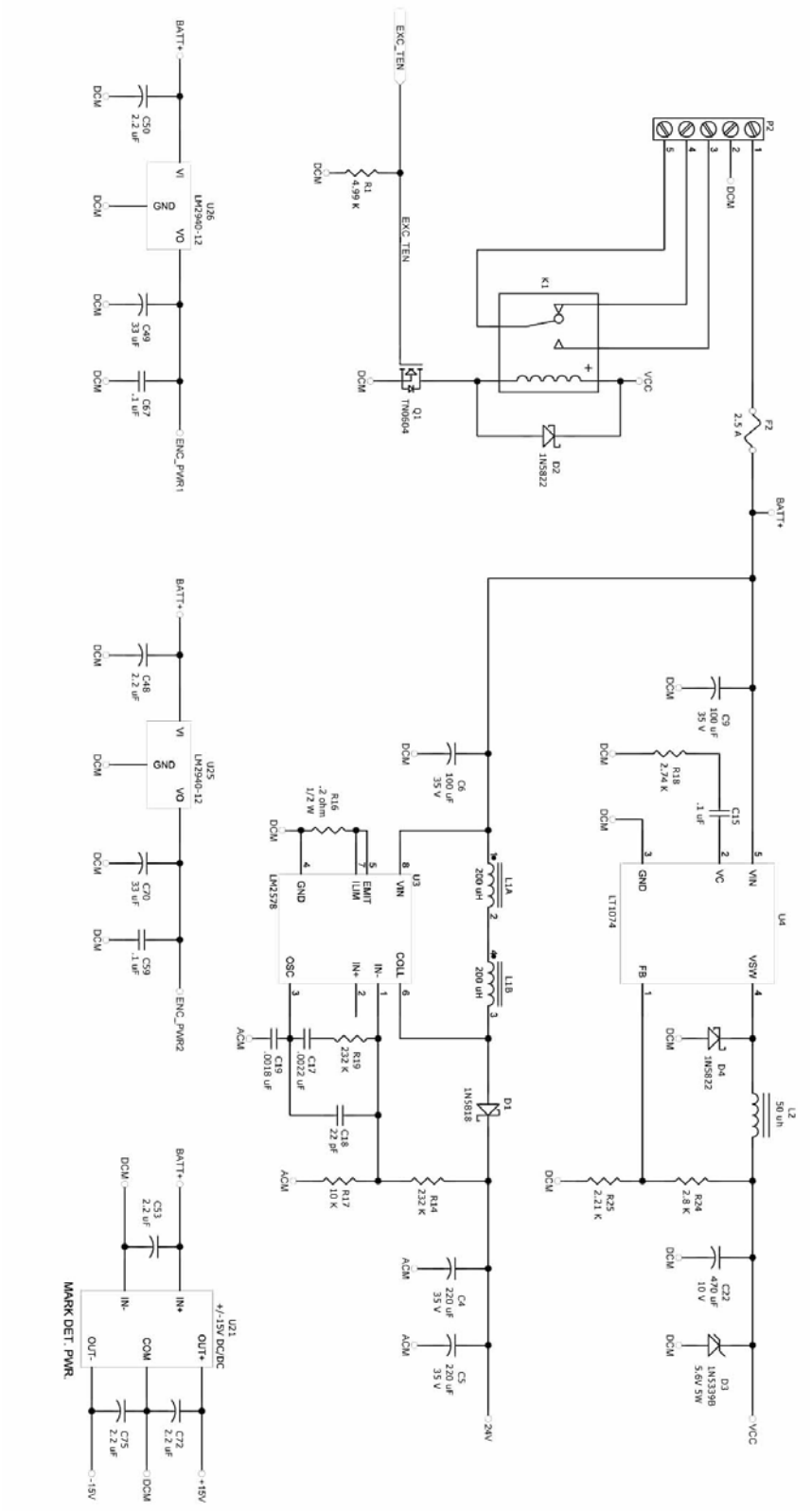
7.1.5 POWER SUPPLIES



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7.2 Wire List

AMS **4A040** WIRING LIST-- REV L

P2 - Screw Terminal Block				
P2 -1	BATT +	RED	P1-7 (FUSE BRD)	SWITCHED POWER
P2 -2	BATT -	BLK - B	J1 B	
P2 -3	CONTACT CLOSURE N.O.	GRN - B	J6 A	Tension Contact Closure Back Panel
P2 -4	CONTACT CLOSURE N.C.	-----	-----	
P2 -5	CONTACT CLOSURE COM	BRN - A	J6 B	Tension Contact Closure Back Panel
P4 - USER SWITCHES (12 PIN)				
P4 - 2	DCM BLK	BLK		One side of SW2, SW3, SW4, SW5, SW6, SW7, SW8, SW9, ENGLISH-, SW 10
P4 - 6	ZERO DIFF. TENSION	GRY	SW4 N.O.	
P4 - 7	TEN TEST		SW5 N.O.	
P4 - 8	ZERO CAL	BRN	SW6 N.O.	
P4 - 9	CANCEL DEPTH ALARM	BLU	SW10 N.O	
P4 - 10	ZERO DEPTH	VIO	SW9 N.O.	
P4-11	DEPTH ADJ DOWN	BLU	SW7 N.O. DN	Dn Contact of SW7
P4-12	DEPTH ADJ UP	ORA	SW7 N.O. UP	Up Contact of SW7

P5 - SPARE (12 PIN)				
P5 - 1	+5V	RED	D1 4	DISPLAY POWER
P5 - 2	MENU	YEL	SW8	MENU SELECT
P5 - 3	DIFF / INC	GRN	SW 3	
P5 - 6	MMD RESET	VIO	SW 2	

P6 - ANALOG IN/OUT (16 PIN)				
P6 - 1	LOAD PIN POWER +	RED	P1-10 FUS BRD	LOAD PIN +15V
P6 - 2	LOAD PIN POWER -	BLK	P1-9 FUS BRD	LOAD PIN -15V
P6 - 3	LOAD PIN SIG+	ORA	J2 10	LOAD PIN SIG+

P6 - 4	LOAD PIN SIG-	BLK	J2 22	LOAD PIN SIG-
P6 - 7	SHUNT CAL ENABLE	GRN	J2 9	SHUNT CAL
P6 - 8	ACM	BLK	J2 21	GROUND
P6 - 9	4to20OUT	BRN	J5-12	4 to 20 mA to system
P6 - 10	ACM	BLK	J5-21	TENSION OUT- TO SYSTEM
P6 - 11	0-2V OUT (TENSION)	GRAY	J5-9	TENSION OUT+ TO SYSTEM
P6 - 15	DIFF TENSION METER -	YEL	M1 -	
P6 - 16	DIFF TENSION METER +	BLU	M1 +	

P7 - COMMUNICATIONS (12 PIN)				
P7 - 1	RS485 TX+	GRAY	J3-8 + J4-8	RS485 TX+ (2 WIRES)
P7-2	RS485 TX-	BLK	J3-9 + J4-9	RS485 TX- (2 WIRES)
P7 - 3	RS485RX-	GRN	J3-5 + J4-5	RS485 RX- (2 WIRES)
P7 - 4	RS485RX+	BLU	J3-4 + J4-4	RS485 RX+ (2 WIRES)
P7 - 7	COM2 TXD	ORG	D1-5, D2-5, D3-5, D4-5	DISPLAY DATA - FOUR WIRES CONNECTED TOGETHER
P7 - 9	GND	BLK	J3-3 + J4-3	RS485 GND (2 WIRES)
P7 - 12	GND	BLK	D1 1	DISPLAY GND

P8 - QUADRATURE OUT / INDICATORS (16 PIN)				
P8 - 1	METRIC LED -	BRN		METRIC LED KATHODE (-)
P8 - 2	METRIC LED+ & 6.8VZKathode	ORN	METRIC LED+ & 6.8VZKathode	METRIC LED ANODE & 6.8VZKathode 6.8VZAnode to ENGLISH LED +
P8 - 3	EXCESSIVE TENSION LED	GRAY	DS 1+	LED
P8 - 4	EXCESSIVE TENSION LED	WHITE	DS 1-	LED
P8 - 5	EXCESSIVE TENSION ALM -	GRN Beeper	ALM1 -	Beeper
P8 - 6	EXCESSIVE TENSION ALM +	YEL	ALM1 +	Beeper

P8 - 9	APPROACHING SURFACE LED -	VIO	SW 10	+1 (inline with silver plate)
P8 - 10	APPROACHING SURFACE LED +	BLU	SW 10	-1 (opposite silver plate)
P8 - 11	PHASE 1B*	YEL	J5 15	Quadrature Out - PHASE B*
P8 - 12	PHASE 1B	BLU	J5 3	Quadrature Out - PHASE B
P8 - 13	PHASE 1A*	RED	J5 14	Quadrature Out - PHASE A*
P8 - 16	PHASE 1A	ORA	J5-2	Quadrature Out - PHASE A

P9 - ENCODER 1 (12 PIN)				
P9 - 1	DCM	BLK	J2 14	Encoder Ground
P9 - 2	DCM	BLK	J5-13	Encoder Ground
P9 - 5	ENCODER PWR - TO FUSE	YEL	NO CONNECT	
P9 - 8	ENCODER 1B	BLU	J2 4	Encoder input
P9 - 9	ENCODER 1B *	GRN	J2 16	Encoder input
P9 - 11	ENCODER 1A	ORA	J2 3	Encoder input
P9 - 12	ENCODER 1A*	RED	J2 15	Encoder input

P10 - ENCODER 2 (12 PIN)				
P10 - 1	DCM	BLK	J2 17	Encoder Ground
P10 - 5	ENCODER PWR - TO FUSE	YEL	NO CONNECT	FUSE BOARD P1:6
P10 - 8	ENCODER 2B	BLU	J2 7	Encoder input
P10 - 9	ENCODER 2B *	GRN	J2 19	Encoder input
P10 - 11	ENCODER 2A	ORA	J2 6	Encoder input
P10 - 12	ENCODER 2A*	RED	J2 18	Encoder input

P11 +/- 15 VDC (12 PIN)				
P11-1	DIG GND	BLK	J2-23	MMD POWER COMMON
P11-3	5V ENCODER PWR - TO FUSE BOARD	YEL	P1-2, P1-6 fuse board	FUSE BOARD P1-2 and P1-6 (2 wires)
P11 - 8	WEAK MARK+	WHT	J2 24, J5-22	WEAK MARK IN- (2 WIRES)
P11 - 9	WEAK MARK-	VIO	J2 12, J5-10	WEAK MARK IN + (2 WIRES)
P11-10	MMD POWER +	RED	P1-3 FUS BRD	MMD POWER +
P11-11	STRONG MARK +	BLU	J2-25	STRONG MARK IN -
P11-12	STRONG MARK -	GRAY	J2-13	STRONG MARK IN +

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D1 DISPLAY - MMD DEPTH (10 PIN)				
D1-2	GND	BLK	D2 1	GND OUT
D1-6	+5V OUT	RED	D2 4	POWER OUT

D2 DISPLAY - DEPTH (10 PIN)				
D2-2	GND	BLK	D3 1	GND OUT
D2-6	+5V OUT	RED	D3 4	POWER OUT

D3 DISPLAY - LINE TENSION (10 PIN)				
D3-2	GND	BLK	D4 1	GND OUT
D3-6	+5V OUT	RED	D3 4	POWER OUT

D4 DISPLAY - LINE SPEED

FUSE BOARD

P1-1	SW1 ON/OFF 12V BATT	RED	SW1-COM	
P1-4	ENCODER1 PWR FUSED		J2-2	
P1-5	MMD PWR (+15) FUSED	RED	J2-11	
P1-8	ENCODER2 PWR FUSED		J2-5	
P1-11	LOAD PIN -15		J2-20	
P1-12	LOAD PIN +15		J2-8	

J3 RS485 IN DB9-P (DB9-MALE)

J3-1	CTS+	ORN	J4-1	
J3-2	CTS-	BRN	J4-2	
J3-6	RTS+	VIO	J4-6	
J3-7	RTS-	GRY	J4-7	

J4 RS485 OUT DB9-S (DB9-FEMALE)

J2 EXTERNAL SIGNALS IN

J5 OUTPUT TO SYSTEM			

J1 12V POWER IN				
J1-A	12V POWER IN	RED	SW1 NO	12V POWER TO PANEL

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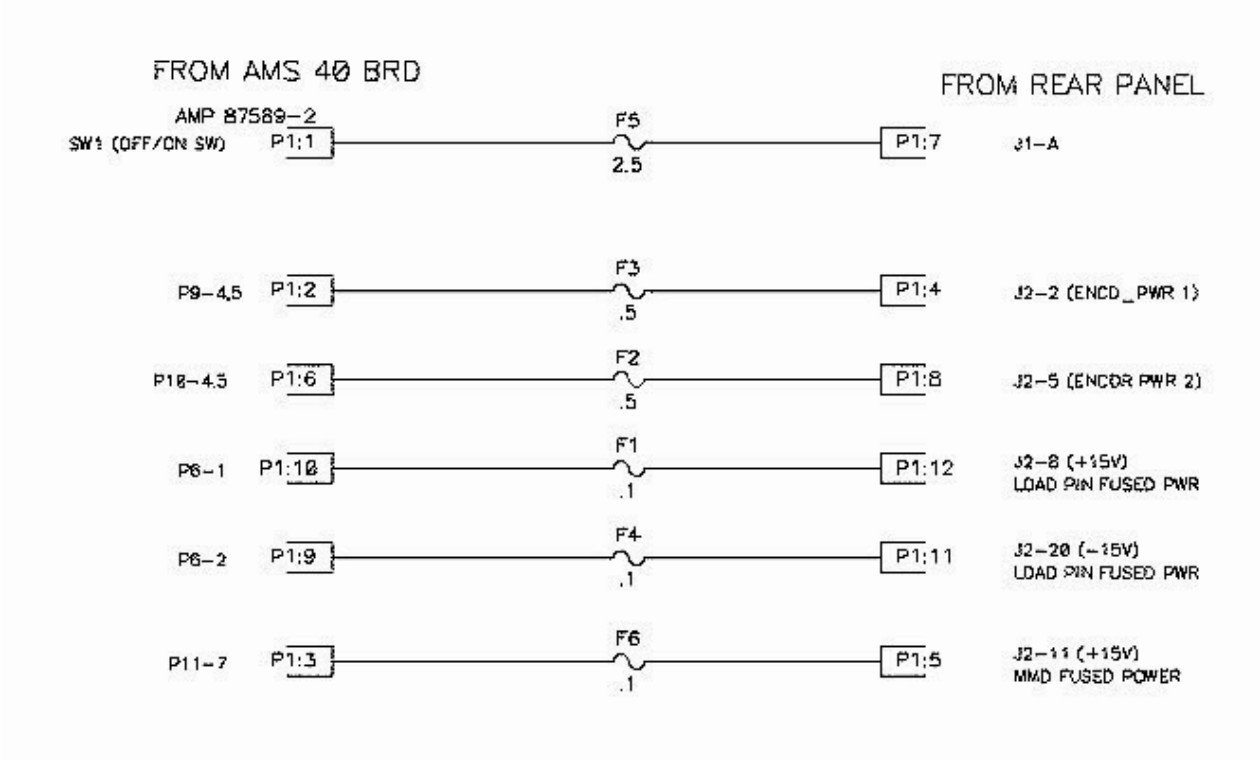
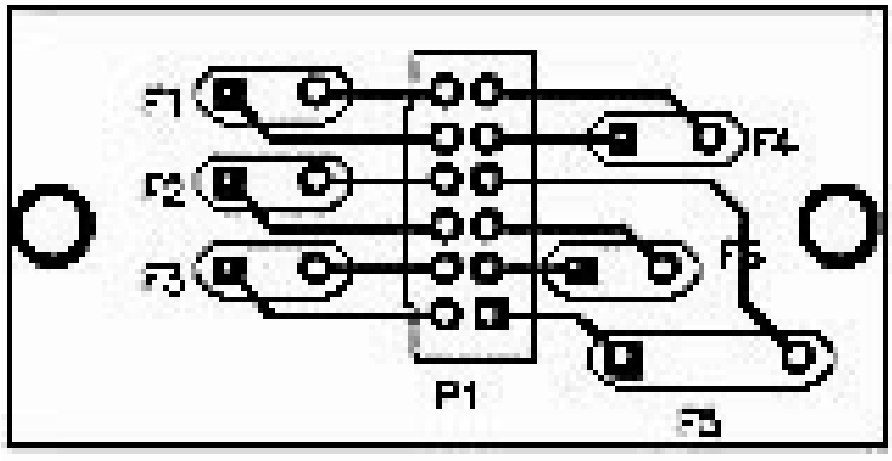
7.3 FUSE BOARD AND POWER WIRING

Refer to 5.2 for wirelist





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7.4 DIGITAL DISPLAY SETUP

The four digital displays can be set for address, baud rate, and brightness.

The button nearest the connector selects the parameter (address, baud rate, brightness).
The center button increments the parameter up
The end button increments the parameter down.
After the parameter is set, press the parameter button again to store it.

The addresses should be set as follows:
- Line Tension = 1
- Line Speed = 2
- Depth = 3
- MMD = 4

Set Baud Rate to 9600
Set Brightness to 15

7.5 BACK PANEL CONNECTOR PINOUT

J1 A	**12 - 24 VDC IN**	
J1 B	**12 - 24 VDC GROUND**	
J2-2	**ENCODER1 PWR FUSED**	**ENCODER1 PWR FUSED**
J2 3	**ENCODER 1A**	**ENCODER INPUT**
J2-5	**ENCODER2 PWR FUSED**	**ENCODER2 PWR FUSED**
J2 4	**ENCODER 1B**	**ENCODER INPUT**
J2 6	**ENCODER 2A**	**ENCODER INPUT**
J2 7	**ENCODER 2B**	**ENCODER INPUT**
J2-8	**LOAD PIN +15**	**LOAD PIN +15**
J2-9	**SHUNT CAL**	
J2-10	**LOAD PIN SIGNAL +**	
J2-11	**MMD PWR (+15) FUSED**	**MMD PWR (+15) FUSED**
J2 12	**MARK- IN**	**WEAK MARK IN + (2 WIRES)**
J2-13	**STRONG MARK -**	**STRONG MARK IN +**
J2 14	**ENCODER GROUND (DCM)**	**ENCODER GROUND**
J2 15	**ENCODER 1A***	**ENCODER INPUT**
J2 16	**ENCODER 1B ***	**ENCODER INPUT**
J2 17	**ENCODER GROUND (DCM)**	**ENCODER GROUND**
J2 18	**ENCODER 2A***	**ENCODER INPUT**
J2 19	**ENCODER 2B ***	**ENCODER INPUT**
J2-20	**LOAD PIN -15**	**LOAD PIN -15**
J2-21	**LOAD PIN GROUND (ACM)**	
J2-22	**LOAD PIN SIGNAL -**	
J2-23	**MMD POWER GROUND (DCM)**	**MMD POWER COMMON**
J2 24	**MARK+ IN**	**WEAK MARK IN- (2 WIRES)**

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J2-25	**STRONG MARK +**	**STRONG MARK IN -**
J3-1	**CTS+ IN**	
J3-2	**CTS- IN**	
J3-4	**RS485RX+**	**RS485 RX+ (2 WIRES)**
J3-5	**RS485RX-**	**RS485 RX- (2 WIRES)**
J3-6	**RTS+ IN**	
J3-7	**RTS- IN**	
J3-8	**RS485 TX+**	**RS485 TX+ (2 WIRES)**
J3-9	**RS485 TX-**	**RS485 TX- (2 WIRES)**
J4-1	**CTS+ OUT**	
J4-2	**CTS- OUT**	
J4-3	**GND**	**RS485 GND (2 WIRES)**
J4-4	**RS485RX+**	**RS485 RX+ (2 WIRES)**
J4-5	**RS485RX-**	**RS485 RX- (2 WIRES)**
J4-6	**RTS+ OUT**	
J4-7	**RTS- OUT**	
J4-8	**RS485 TX+**	**RS485 TX+ (2 WIRES)**
J4-9	**RS485 TX-**	**RS485 TX- (2 WIRES)**
J5-2	**PHASE 1A**	**QUADRATURE OUT - PHASE A**
J5 3	**PHASE 1B**	**QUADRATURE OUT - PHASE B**
J5-8	**4 to 20 MA OUT**	**4 TO 20 MA TO SYSTEM**
J5-9	**0-2V OUT (TENSION)**	**TENSION OUT+ TO SYSTEM**
J5-10	**MARK- OUT**	**WEAK MARK IN + (2 WIRES)**
J5-13	**ENCODER GROUND (DCM)**	**ENCODER GROUND**
J5 14	**PHASE 1A***	**QUADRATURE OUT - PHASE A***
J5 15	**PHASE 1B***	**QUADRATURE OUT - PHASE B***
J5-21	**TENSION OUT COMMON (ACM)**	**TENSION OUT- TO SYSTEM**
J5-22	**MARK+ OUT**	**WEAK MARK IN- (2 WIRES)**
J6 A	**TENSION CONTACT RELAY COMMON**	
J6 B	**TENSION CONTACT RELAY N.O.**	

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7.6 SPARE PARTS LIST

	Part No.	Description	Qty	Reference
1	AMS4P134E	PC BOARD AMS40 REV E W/2xRS232 1x485	1	MOTHER BOARD
2	AMS4P110	METER ANALOG DIFF TENSION (+/- 1000 LBS)	1	M1
4	AMS4P120	DISPLAY LED .5" SERIAL 2"X3.5"	4	D2, D3
6	ACMU1P06	LED RED DIALIGHT 5V	1	APPROACHING SURF
7	ACMU1P11	SONALERT #SC628D MALLORY	1	ALARM
9	AMS4P020	SWITCH MTL-106D ALCO LOCKING	2	POWER ON/OFF
10	AMS4P018	SWITCH MPA-106F ALCO PUSH MOM	5	MENU, T-ZERO, T-TEST, D-ZERO, METER RESET
11	AMS4P044	SWITCH TOGGLE DPDT MOM OFF MOM	1	+ / -
12	AMS4P021	SWITCH CAPS ALCO C-22 BLACK	3	T-ZERO, D-ZERO, METER RESET
13	AMS7P017	SWITCH CAP ALCO C-22 RED	1	D-ZERO, MENU
28	ACMU3P01	CONN MS3102E-14S-9P RECEPT	1	POWER IN
29	ACMU3P02	CONN MS3102E-14S-9S RECEPT	1	OVER TENSION OUT
30	AMS4P163	CONNECTOR DE-9P	1	RS485 IN
30	AMS4P164	CONNECTOR DE-9S	1	RS485 OUT
40	AMS4P041	SWITCH PUSHBUTTON LIGHTED SPST	1	APPROACHING SURF
41	AMS4P042	LENS RED C&K SWITCH	1	RED LENS
42	AMS4P043	LED RED FOR C&K PUSHBUTTON SW	1	RED LED

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8.0 CCL MODIFICATION PROCEDURE

MODIFICATION (AMS4A813) TO AMS4A040 PANEL

Modification adds the CCL Detector and depth display

The panel will now detect and display the depth where a collar was detected. The CCL signal is provided from the Perforating Panel output.

PARTS REQUIRED

AMS4A686	FUSE / CCL BOARD
AMS4A812	CABLE ASSEMBLY
AMS4P693	AT27C512R EPROM
AMS4P862	AT17LV256-10PU EEPROM
AMS4P787	TIE WRAP

Installation instructions for the new CCL/FUSE board in the 40 panel.

1. Remove the rear connector panel.

2. Do a continuity check between J2 Pin 13 (SIG IN) connector on back panel and R39 on 40 board (goes through connector P11 pin 12), J2 Pin 25 (SIG IN) connector on back panel and R38 on 40 board (goes through P11 pin 11) and J2 Pin 23 and TP1 on the 40 board (goes through P11 pin 1). All should be approximately 0 ohms. Refer to figures 1 and 2.

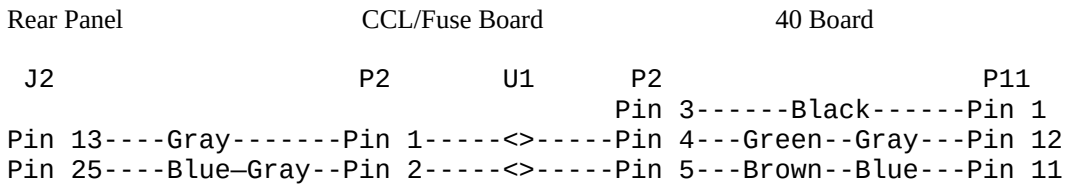

Fig. 1

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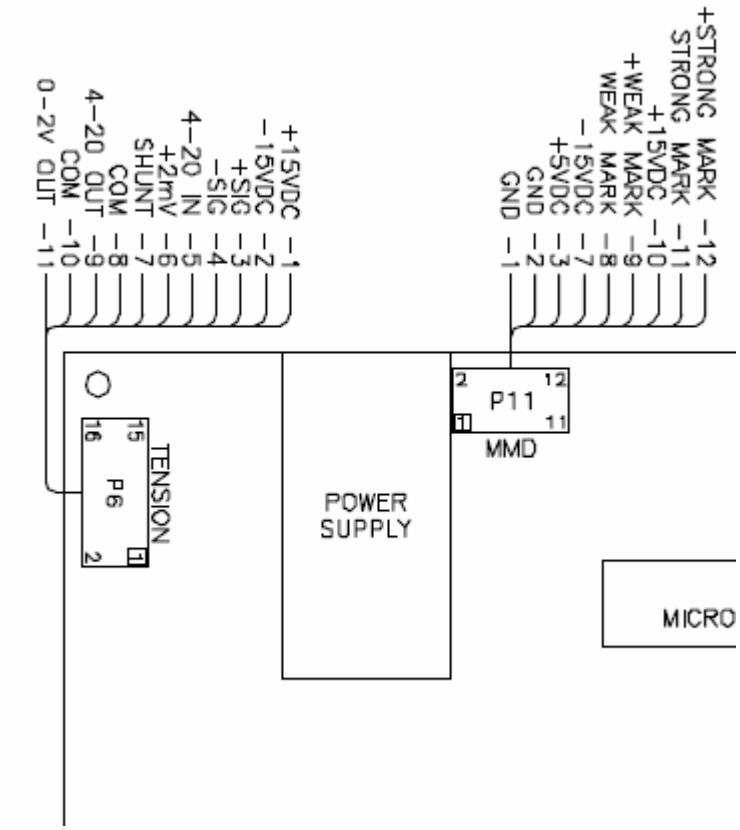

Fig. 2

3. Remove connector P1 from fuse board, noting orientation of wires in plug in relationship to the large fuse (F5). Refer to figure 3.

4. Remove old fuse board. Refer to figure 3.

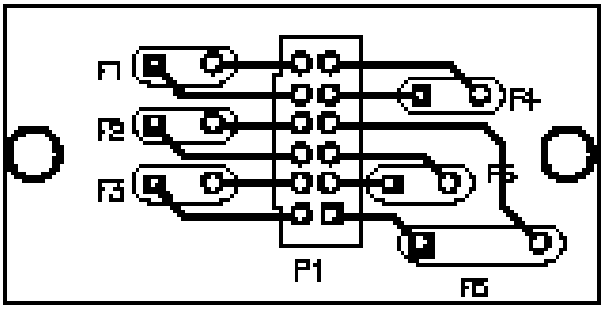

Fig. 3 – old fuse board (P1 connector orientation)

5. Install new fuse board, ensuring orientation of wires in P1 are the same orientation to large fuse (F5) as original installation. Install new cable assembly (AMS4A812) to location P2 on the fuse board noting the location of pin 1 on the board as shown in figure 4 as well as on the connector itself.

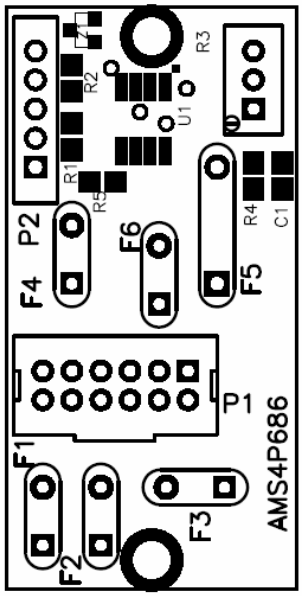

Fig. 4 New fuse board (R3 location, CCW arrow)

6. Cut the wire coming from J2-23 at a convenient distance from J2 so that another wire can be spliced to it.

7. Cut the wire coming from J2 pin 13 at a convenient distance from J2 (SIG IN) so that another wire can be spliced to it.

8. Cut the wire in the new cable assembly (AMS4A812) going to the new connector P2 Pin 1 designated by the arrow on the connector to the length needed and splice to the wires that were cut coming from the rear panel J2 (SIG IN) pins 23 and 13. Solder the wires together and install with heat shrink over the solder connection.

9. Cut the wire coming from the rear panel J2 (SIG IN) pin 25 at a convenient distance from J2 (SIG IN) so that another wire can be spliced to it. Splice the gray wire that is inserted into the new cable assembly (AMS4A812) P2 pin 2 that will plug into the new CCL fuse board to the wire that was cut going to J2 pin 25 on the rear panel.

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10. Cut to the length needed and splice the black 22 awg wire that is connected to the new cable assembly P2 pin 3 that will plug into the new CCL fuse board to the wire that was cut going to P11-1 on the 40 PC board.

11. Cut to the length needed and splice the gray 22 awg wire connected to the new cable assembly P2 pin 4 that will plug into the new CCL fuse board to the wire that was cut going to P11-12 on the 40 PC board.

12. Cut to the length needed and splice the blue 22 awg wire connected to the new cable assembly P2 pin 5 that will plug into the new CCL fuse board to the wire that was cut going to P11-11 on the 40 PC board.

13. Remove the old EPROM (U2) from the 40 PC board and insert the new one provided.

14. Remove U17 and insert the new one provided.

15. To test the operation of the panel, adjust R3 on the CCL/Fuse board to receive satisfactory collars if needed. The boards were set to a threshold value of approximately +1.5V input to the CCL circuit during testing. Setting the input to +1.5V would be a good starting point to set up the circuit before installing the panel in a unit. CCW adjustments of R3 will raise the threshold voltage required to acquire a CCL mark (less sensitive). Example: If CCL marks are constant as the tools go down hole, adjust R3 CCW until CCL marks are on depth. Example #2: If no CCL marks are found, turn R3 clockwise. An oscilloscope across CCL/Fuse board P2 pin 2 (signal) and 40 board TP1 (ground) will allow you to see the input signal as you make your adjustments. Refer to Figures 2 and 4.

16. Use ty-wraps to hold wires together as needed.

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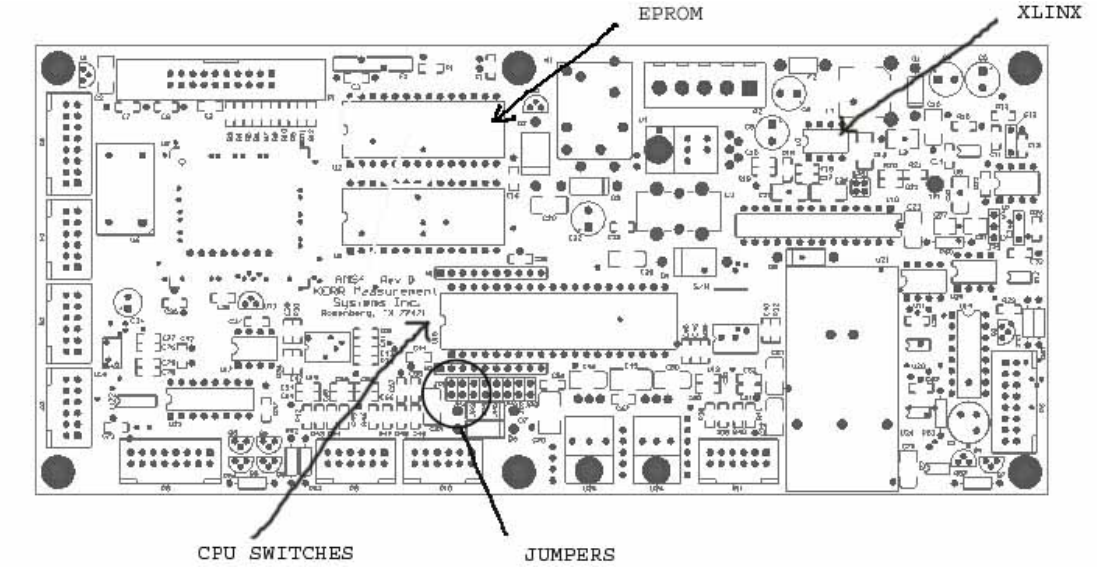
9.0 INSTALLING NEW SOFTWARE

The software that controls this panel is stored in an EPROM Integrated Circuit located at U2 (see drawing below). To upgrade the software to a new version, simply remove the eprom I.C. and install a new eprom I.C. (be careful not to bend the legs during installation).

In the event of a jumper change, software change, panel "lock up" or other malfunction, the processor in the panel can be rebooted by turning off the panel, depressing the T-ZERO and T-TEST buttons simultaneously then turn the power back on while the buttons are depressed.

When the panel is rebooted, all the menu settings will be returned to the default settings. “RESET” should be displayed on the tension display during re-boot if 3K or 5K is selected. On power up the revision of the software is displayed on the depth display except for FOCUS mode. The current version at the writing of this document is 4001.21.



To operate from the EPROM instead of the Micro-Controllers internal memory, set the switches on the CPU “piggy-back” PCB (if installed) as follows:

1 - TOWARD CPU
2 – TOWARD CPU
3 - TOWARD CPU

The latest version of the Xlinx code is Rev B. Verify that the small plug in IC located as shown above is Rev B. If not, replace it with a Rev B I.C.
This code will improve the line speed output. The Rev A code will still work but it is recommended to install the Rev B code when possible.

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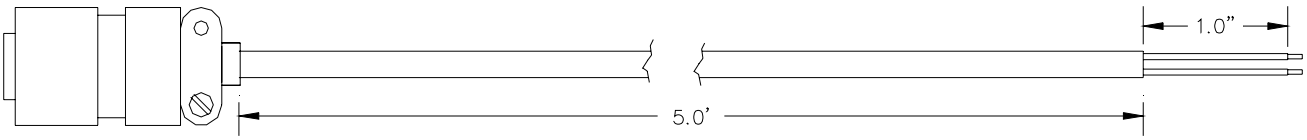
10.0 CABLE DIAGRAMS

10.1 AMS7A022 CABLE ASSEMBLY – DC POWER IN



A – WHITE
B – BLACK

A = +
B = -

Kerr p/n	Description	Qty	
AMS7P061	CABLE 16-2 SJ CORD BELDEN 8472	5	FT
AMS7P044	CONN MS3106E-14S-9S	1	EA
AMS7P063	BUSHING #9779-513-6 AMPHENOL	1	EA

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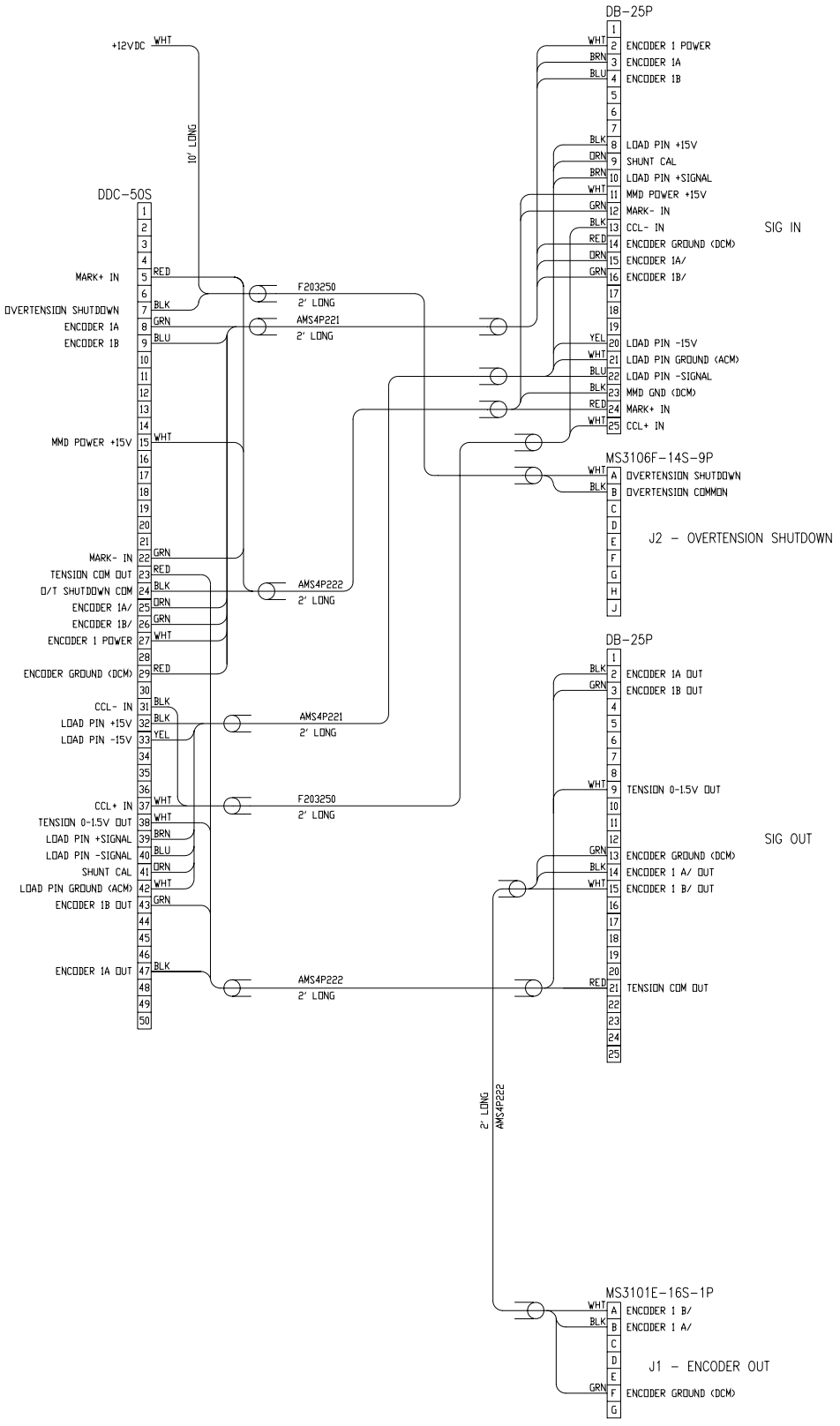
10.2 LOGGING UNIT INTERFACE CABLE HARNESS AMS4A187



11.0 CE TEST CERTIFICATE

epsilon

Test Certificate

In accordance with
European Directive 89/336/EEC as Amended by European Directive 93/68/EEC
"EMC Directive"

Date: 17th September 2002

Certificate Number: Epsilon 02TEST1170

ECS Project Number: ETS0548

ECS Report Number: RETS0548/A/1

Manufacturer: Kerr Measuring Systems Inc
6415 Reading Road
Rosenberg
Texas
USA
TX 77471

Epsilon hereby declares that the products:

AMS4A040 and AMS4A041 Winch Operators Panels

Are in Compliance with the requirements of the listed directives.

Equipment Specification: The full product specifications are listed in report number RETS0548/A/1.

The following Harmonised European Standards have been applied:

EN 61326: 1997 + Amendments A1: 1998, (Electrical equipment for measurement, control and laboratory use EMC Directive) EN 61000-4-2: 1995, EN 61000-4-3: 1998, EN 61000-4-4: 1995, EN 61000-4-5: 1995, EN 61000-4-6: 1996.

This Certificate May Only Be Used In Its Entirety and Without Change

On Behalf of Epsilon Certification Service.

Stephen L D'Henin
Certification Manager
Epsilon Certification Service

Annex I is a part of this declaration.

National Association of Professional Inspectors & Testers

ISO 9002 sira UKAS QUALITY MANAGEMENT 011

Epsilon Compliance
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email: info@epsilon-ltd.com, Website :www.epsilon-ltd.com.

EPSILON CERTIFICATION SERVICE ASCR(E)

Page 1 of 2

Test Certificate
Annex I

(In accordance with European Directive 89/336/EEC as Amended by European Directive 93/68/EEC "EMC Directive")

Date: 17th September 2002

Certificate Number: Epsilon 02TEST1170

ECS Project Number: ETS0548

ECS Report Number: RETS0548/A/1

The equipment has been assessed and type tested against the relevant harmonised European Standard and has been found to be compliant provided that the following conditions are complied with by the end user:

a) The electrical supply to the apparatus shall be within the manufacturer's specified limits (12-24VDC +/- 10%).

b) The apparatus when installed in industrial locations shall be supplied from a power supply that offers suitable protection from voltage surges. This requirement is not required for use within a controlled EM environment has determined by EN 61326 or when the application for which the apparatus is being utilised does not require such protection.

Epsilon Compliance
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